File: Productivity

12 May 1981

MEMORANDUM FOR: Director of Data Processing

FROM: Deputy Director for Applications

SUBJECT: Recommendations for the Improvement of Applications Productivity

Bruce:

    1. The attached document is the output from the Productivity Working Group that began its work in October. As you can see, it covers a wide range and has several points of view. Overall, I think they did a fairly good job of breaking down the question-naires, analyzing the responses, and coming up with some sound suggestions that we can use to move forward in this area.

    2. Our next step will be to discuss this in depth with the Working Group at the Applications Management meeting in June. As a result of that meeting, I would hope that we could agree on sev-eral specific areas in which to move forward. Fortunately, as this group points out, a lot of work needs to be done, but a lot of things can be done in parallel. I think we can look forward to some significant progress during this year.

STAT   3. I have taken liberty of also forwarding a separate copy to [ ] for his information.

STAT

Attachment: As Stated
STAT   DD/A/ODP:[ ]/rsl[ ]12May81
STAT Distribution:
    Original - Addressee
        1 - DD/A Chrono
        1 - Prod. Wg. Gr. File

TRANSMITTAL SLIP | DATE 5/13

TO: D/ODP

ROOM NO. 2D00 | BUILDING HQ

REMARKS:

DD has his own copy.

E — I'd like a file under special projects on "Productivity," pls. Thx

FROM:

ROOM NO. | BUILDING | EXTENSION

FORM NO. 241
1 FEB 55

REPLACES FORM 36-8
WHICH MAY BE USED.

(47)

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1 May 1981

MEMORANDUM FOR: Deputy Director for Applications
                 Office of Data Processing

FROM: Applications Productivity Working Group

SUBJECT: Recommendations for the Improvement of
                 Applications Productivity

I. MISSION AND SCOPE

1.   The Applications Productivity Working Group, (APWG) was
formed in November 1980 by the Deputy Director for Applications,
ODP (DD/A/ODP) to study, evaluate, and recommend means to improve
the productivity of the Applications divisions of ODP. The APWG,
with the approval of the DD/A/ODP, defined the scope of its mis-
sion to cover both an increase in the amount of product produced
per unit of resource expended, and a quality improvement of the
product.

2.   The Applications divisions of ODP produce a wide variety
of products, ranging from large, integrated and complex software
systems incorporating their host computers, networks and environ-
ments, down to small and simple programs to meet the day-to-day
needs of the Agency clients. All of the software developed is in
some way maintained, and thus modified to eliminate problems or
meet evolving user requirements. Applications' clientele is
effectively and potentially every office and staff of the CIA, and
outside components and agencies of the Intelligence Community.
Computer applications include the support of all types of discip-
lines, resulting in products which must perform data base manag-
ment, scientific, mathematical/statistical, text processing, or
most other imaginable data processing tasks.

3.   In this product environment, there is currently no simple,
quantifiable definition for productivity which could accurately
and meaningfully demonstrate present performance or reflect the
impacts of changes or improvements to the way Applications does
business. Thus, the APWG did not attempt to define metrics which
would demonstrate productivity, but instead focused on directions,
which when taken would be expected to improve Applications' abil-
ity to produce a quality product.

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II. BACKGROUND

1. In October 1980, the DD/A/ODP circulated a "Productivity Improvement Questionnaire" designed to elicit opinions on and recommendations for its stated goal. The first task of the APWG was the analysis and evaluation of these questionnaires. The APWG was able to define general categories of suggestions, and collate the wide variety of responses into a list of response types with their frequencies by category. This summary is included as Appendix A. The categories were in no way mutually exclusive, but did reflect major areas for exploration by the APWG. Further refinement of this material resulted in the seven categories which are the basis of discussion in Appendices B through H, and which are:

- Management of People
- Management of Applications Development and Support
- Services Support
- Tools Support
- Training
- Environment
- End User Development of Applications

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2. These partitions of the problem allowed individual APWG members to focus on a particular area, rather than address the whole problem, and provided clear boundaries for group review of individuals' contributions. The Appendices (B through H) are those reviewed, individual contributions. Appendix I is a recommendation submitted by the Chief of A Division concerning space and environmental requirements for programmers and analysts. The next section attempts to draw together the recommendations from these papers, and form them into tasks which can be individually accomplished while contributing to an integrated concept of productivity improvement. These recommendations are the products of the APWG drawn from its first six months of analysis of the Applications environment and mission.

III. ANALYSIS AND RECOMMENDATIONS

1. Applications supports a wide variety of functions, along with means for their performance. Except for the effect of a common computer environment, little interface or coproductivity are built into the tools and techniques employed within Applications to manage and do its work. Many tools and techniques are initially selected to meet project-level requirements. Applications-wide requirements are generally not a factor in the selection or creation of tools, nor the derivation of techniques.

2. The problems which are caused by this localized approach are manifested in many ways. Information which would be useful is often not transferred from one function to another. Management resources are dissipated on exercises to simply make the

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administrative system run, no less manage people or create products. Recent statistical analysis of use of technical personnel in B Division showed that the administrative overhead was more than twice that expected and used for planning.

3. We have a large number of software engineering support tools and techniques covering standards, documentation, and the life-cycle phases and functions. Many tools are not properly maintained, yet are expected to help Applications create and maintain its products. Techniques depend on "voluntary" working groups for their standardization, having generally originated from the efforts of some of Applications' most creative staff members. Working groups compete for time with management and production requirements on their members, and generally come out a poor second. Applications has tended to avoid allocating the necessary staff time and resources toward improving the system.

4. While there are a wide variety of recommendations in Appendices B through H, they may be reduced to three broad recommendations:

    1) Perform a comprehensive systems analysis to define an overall Applications' methodology;

    2) Properly upgrade, maintain and administer the tools and techniques presently employed within Applications; and

    3) Modify selected Applications' policies and environment.

Some observations about these recommendations:

    - All must be performed if there are to be major productivity improvements;
    - All require explicit and significant allocation of resources to their accomplishment, to the short-term detriment of the mission of Applications; and
    - All are continuous and recurring.

5. These three broad recommendations summarize an assortment of more specific recommendations produced by the APWG. The assorted detailed recommendations, under headings of the three broad recommendations, are listed with references from their sources in Appendices B through I, and where appropriate, reference Computer Applications Request/Action forms (930's) in Appendix J.

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SYSTEM METHODOLOGY

	Recommendation	Source	930
1.	Develop an overall methodology and standard approach for applications development (incorporating requirements, design, implementation, and documentation) and management.	C,E	J-1
2.	Develop automated support for requirements analysis/specification. Survey available packages.	C,E	J-1
3.	Develop automated support for design analysis/specification.	C,E	J-1
4.	Develop and upgrade implementation tools, including DBMS'.	E	J-1
5.	Develop and upgrade documentation tools.	E	J-1
6.	Provide project scheduling, planning and resource management support at all levels of Applications.	B,C, E,F	J-1
7.	Develop standard metrics for resource utilization and productivity.	B	J-2

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SYSTEM TOOLS AND TECHNIQUES

	Recommendation	Source	930
1.	Establish software engineering tools library, including incentives for contributions, staffing, training, and maintenance.	D,E	J-3
2.	Establish an inventory of applications, referencing people, projects and keywords.	E	J-4

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SYSTEM POLICIES AND ENVIRONMENT

	Recommendation	Source	930
1.	Establish a list of points of contact for ODP experts in key technical areas.	D,E	
2.	Establish ☐ Applications technical library with periodicals, books, video tapes, etc.	B	
3.	Perform long-range personnel planning, especially covering rotational assignments and training.	B	
4.	Coordinate training and assignments.	B,F	
5.	Develop Applications-wide personnel performance criteria.	B	
6.	Plan replacement of high-maintenance systems.	H	
7.	Contract for development, maintenance, and documentation.	B,C	
8.	Define a policy for user development/maintenance of applications.	H	
9.	Encourage users to schedule more meetings ☐	G	
10.	Provide adequate work space for programmer/analysts.	I	
11.	Upgrade tech-writing and provide clerical SCRIPT support.	D	
12.	Install more terminals in ☐ Applications area.	G	
13.	Acquire ☐ hi-quality, hi-speed printer.	G	

STAT (next to 2)
STAT (next to 9)
STAT (next to 12)
STAT (next to 13)

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6. It is probable that a systematic requirements collection and analysis effort, as proposed in methodology recommendation 1, will add to and modify the recommendations listed above. Just as our users' requirements continue to evolve, so will Applications'. The emergence of needs to add and change is normal and healthy, and should be addressed with the allocation of sufficient resources to allow the accomplishment of at least the most urgent tasks. The environment supporting Applications has become too diverse, the tasks too many, and the organization too large to depend on random evolution of philosophy and methodology, as has been the tendency in the past.

STAT

Chairman, APWG

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APPENDIX A

10 December 1980

PRODUCTIVITY WORKING GROUP AREAS

TRAINING FOR THE ANALYST/PROGRAMMER -- [   ]   STAT

    Develop in-house course on project planning, use people from all
      divisions for instructors
    Test people for qualifications before sending to classes
    Increase curriculum (both internal and external) (3)
    Need in-house training more related to Applications needs
    Need training courses to be part-time, vice full-time
    Need training courses on high interest current topics, advanced
      subjects, and newest techniques (software & hardware) (7)
    Provide requirements definition training (2)
    Use Training Staff to teach advanced topics instead of basic
      user courses (3)
    Provide continued training for analysts/programmers in
      structured techniques (2)
    Provide training on learning to become better listeners
    Provide Publications and briefings on generalized software
      development in all divisions

STAT   MANAGEMENT OF PEOPLE -- [   ]

    Allow more time to develop new skills (5)
    Assign fewer tasks per person -- too many to do properly (3)
    Improve poor performance by senior personnel, reduce resistance
      to learning new techniques and to change (5)
    Reduce staff effort being utilized on maintenance tasks (2)
    Plan assignments to coincide with recent training and
      rotations, and plan these changes better (7)
    Move personnel less
    Need more interesting type/level of work
    Need more and better communication mechanisms (2)
    Use AWP to motivate
    Require employees to use a Time-Event chart -- make employees more
      accountable for time usage (2)
    Consider an individual's preferences whenever possible
    Train personnel to replace those going on rotation
    Anticipate and plan ahead for specific project training (4)
    Need more structure in application with regard to maintainence and
      development work areas of speciality
    Establish performance standards for personnel based on
      project stereotyping
    Need better motivation and pride in the finished product

APPENDIX A

MANAGEMENT OF APPLICATION DEVELOPMENT AND SUPPORT -- [   ]   STAT

Have separate development and maintenance activities clearly
    defined
Initiate and enforce closer tracking of projects using new Hardware
    and Software techniques and tools (2)
Improve administrative support (2)
Don't implement all projects
Discontinue less productive and unnecessary paper work,
    aid production maintainence check list before accepting
    programs
Phased implementation
Structured project management and design
Schedule project reviews at shorter intervals
    (i.e. shorter milestones)
Develop long range planning
Management concentration on reducing changes in direction
Management commitment to productivity improvement
Establish management steering committee for productivity
    improvement
Align project management practices with training
Need maintenance group for all PAS work
Reduce administrative overhead on technical personnel
Documentation should be completed at the outset of a project,
    and not "after the fact"
Establish Application-wide test group
Develop systems which require less maintenance
Require Problem Reports for all systems in production
Separation of development & maintenance activities
Code reading and guidance at beginning of projects;
    don't wait until documentation has ended
Schedule project implementation soon after feasibility study
Need maintenance guides for interpretation of newly implemented
    projects (could be shown under documentation)

STAT   STANDARDS --- [   ]

Use of standard software-(DBMS,utilities)
Need definition of productivity and how to measure it (2)
Stricter enforcement of standards (coding, documentation,
    design, etc.) (7)
Need standards for programming, documentation and design (2)
Develop design standards for various languages (2)
Need better and more meaningful documentation standards (9)
In-code documentation (commenting)
Increased effort in requirements review and systems design - The
    main emphasis should be geared toward clarity, simplicity and
    consistency (2)
Clear definition of expected end results of finished products

APPENDIX A

STAT   ENVIRONMENT -- [   ]   STAT

        Improve communications with customers not at [   ] and with
            the support staff (3)
        Improve programming environment- terminal and office space (4)
        Centralize the location of computers, programmers, and users (2)
        Improve accessibility to Hqs. resources (library, CSS, SPD)
        Move back to Hqs.
        Make user travel as well as ODPer
        Need better shuttle service
        Eliminate trips to Rosslyn, C of C, etc.
        Reduce noise in private and central workspace (2)
        Increase number of terminals (5)
        More VM print capability (especially LASER)
        Decrease MTBF and MTTR on existing terminals and system (9)
        Decrease down time for VM and GIMS (3)

        SUPPORT FOR THE ANALYST/PROGRAMMER (PEOPLE) -- [   ]   STAT

        Better communications, between all levels of end users,
            A/ODP, ED/P/ODP and SPD/P/ODP
        Hire technical writer for documentation/manuals
        Provide direct clerical SCRIPT keying support to analysts (10)
        Increase T.O. to handle increasing maintenance burden (2)
        Provide contractor support for maintenance and coding
        Improve secretarial force
        Designate individual or group to keep on top of utilities
        Create an Applications Tech Staff/ Product Development Group
        Create an Applications group to review requirements definition
            and system development (2)
        Designate individuals with expertise in specific hardware/
            software who could provide consultation to programmers (2)

        SUPPORT FOR THE ANALYST/PROGRAMMER (TOOLS) -- [   ]   STAT

        Have more and better defined documentation aids (4)
        Implementation of 'GIMTRAN' software on GIM II
        Increase use of new/existing software tools (2)
        Have someone look into a 'design methodology' package
        Automatic flowchart program (2)
        Microprocessors
        Need better compilers, DBMS, etc.
        Obtain an independent dictionary and directory system to aid
            in system definition and documentation
        Use automated requirements definition, design/development tools
            (PSL/PSA) (6)
        Use structured languages -- PASCAL (2)
        Need to use tools developed outside the Agency
        Implement project planning tools

APPENDIX A

INVENTORY (Index/Library) -- [   ]   STAT

>   Develop index/library of completed applications and system
>   enhancements (2)
>   Develop generalized systems for routine applications
>   which can be tailored for individual components to
>   avoid redundancy and reduce maintenance (3)
>   Develop and distribute a skills bank to support
>   assigning projects and information exchange (2)
>   Catalog, distribute and promote use of the many system and
>   software tools developed and held by small groups or
>   individuals
>   Establish a librarian function to eliminate D/E
>   of program code by programmer/analyst
>   Automated locating of experts for design and program aid
>   standard software packages to do like tasks

END USER APPLICATION DEVELOPMENT -- [   ]   STAT

>   Train users for maintenance and general education (2)
>   Increase support by customers of completed applications
>   Design systems for non-technical users (simplify) (2)
>   Use of friendly and easy to use high-level languages
>   Additional graphics capabilities -- such as TELAGRAF (2)
>   Obtain application generators to enable quick generation of
>   'bread board' models and simple applications
>   Support the use of ORACLE relational DBMS

1.0 Overview

"Management" is a relationship between people, concerning a work
assignment. Computer programmers, analysts, and project leaders are
classed as "knowledge workers". That is, the jobs performed by these
persons require more mental than physical labor, and demand
originality and creativity. Management of "knowledge workers" is not
an easy task. Individual skills and capabilities vary widely across
personnel. "Knowledge workers" demand a significant influence over
the direction of their jobs and careers. None of these difficulties
is unique to either ODP/Applications or the data processing field.

The formal organization of ODP/Applications ends at the Division
management level. Below this level, the day-to-day work is
accomplished by overlapping combinations of project teams, task
forces, working groups, and individual efforts. Such an organization
is both good -- in that it permits maximum flexibility, and bad -- in
that it results in fragmentation of both resources and authority.

Management of people has been typically divided into two types of
activities -- those which are people oriented and those which are task
oriented. This paper does not address the people oriented side of
management for two reasons. First, there are few universally accepted
"good" and "bad" ways of relating to people on a supervisor-employee
level. And secondly, even if there were accepted norms for this
relationship, they could not be effectively mandated, monitored, or
enforced. Thus, this paper deals with the structure and organization
of tasks, rather than the techniques used to motivate people to do
them well.

In order for a person to perform work tasks productively, he/she must:

- Fully understand the overall job function.
- Fully understand the specific work task.
- Receive continual feedback on performance.
- Provide to management continued feedback on the job
  and work.
- Be able to ask for and receive help, information,
  and guidance.
- Have the training, experience, skills, and environment
  needed to perform the task.

Each of these is discussed separately below:

Understanding the Job -- Computers do well when given a mindless
sequence of tasks; people do not. For people to be they must first
understand the overall function of their job. This includes:

- A job description

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- Job performance criteria
- General guidance

A job description should identify the overall responsibilities, skills
and skill levels, relationships to other jobs, and activities to be
performed. Job performance criteria should define policies,
procedures, and constraints which apply to the overall job. Together
these two provide the baseline for a job or job class. All employees
performing the same job should have the same job description and
performance criteria. General guidance is provided by a manager to
set priorities, emphasize certain aspects of the job, and to convey
the style, experience, and approach favored by the manager. This
guidance may change over time, and may vary across managers.

Within ODP/Applications, formal job descriptions are used sparingly,
if at all. Many people have never seen their job description. They
are not used in performance appraisal. Instead, the General
Objectives portion of the employee's Advance Work Plan (AWP) is used.
It is recommended that all ODP/Applications job descriptions be
reviewed, updated if appropriate, and made available to all personnel.
A set of Applications-wide performance criteria should be developed
for each job description, and made a part of the Performance Appraisal
Report (PAR). The AWP should contain only those duties and tasks
which are specific for an individual, such as project assignments.

In the area of performance criteria, we need to develop positive,
negative, and absolute criteria. Positive criteria identify things
which are desirable, allowing room for various levels of achievement.
Negative criteria identify things which are not desirable, allowing
room for various levels of avoidance. Absolute criteria identify
things which must be adhered to, with no room for deviation.

Understanding the Task -- A task, as used in this paper, means a
separate activity or duty performed as a part of, or complementary to,
the job function. Tasks vary by individual. In order for the
individual to perform the task productively, he/she must be given:

- The goals and objectives of the task.
- Specific guidance.

A goal is a general statement concerning the desired outcome of the
task. An objective is a specific, measurable event which contributes
to achievement of a goal. Specific guidance is provided by a manager
to set priorities among tasks, emphasize certain aspects of the task,
define relationships between tasks, and convey the experience and
approach favored by the manager. This guidance will vary over time
and across managers, and may vary across tasks.

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The AWP is, and should be, used by Applications managers to identify
individual task assignments and performance objectives. However, it
should not be used as a job description – as is often the case
currently. It is recommended that supervisors take a more active role
in the creation and updating of AWP's . In some instances, these
duties are assumed solely by the employee. Letters of Instruction
(LOI's) quickly degenerated into paper exercises in recent years. The
AWP will undoubtably suffer a similar fate unless it is taken
seriously.

Receiving and Giving Feedback –– A key role of the manager is giving
and receiving feedback on work and work performance. The manager
gives feedback both correctively to influence performance which is not
achieving its objectives, and as a reinforcement to encourage the
desired performance. The PAR, a formal annual event, cannot be
considered as a feedback mechanism. Unlike a vaccination, a once
yearly booster shot of feedback does not immunize an employee against
poor performance. The only useful purpose served by the PAR is as a
backup justification for employee promotion or demotion. An undue
emphasis on either the PAR or AWP indicates that the truly important
aspects of feedback –– that it is continual, fair, honest, and uniform
–– have been missed.

The employee must be encouraged to give feedback concerning the job
and work assignments. An excellent means for achieving this end is to
involve the employee in the work-related decision-making process. As
a minimum, the employee feedback should be a report on the status of
their tasks –– what they did; what they plan to do; problems they
have; and their long-term evaluation of the work status.
Additionally, the employee must be able to suggest changes to the work
and propose exceptions to general rules. The less formal that the
feedback mechanism is, the more likely the manager is to hear the true
status and suggestions. Further, the manager who responds to a
suggestion with "That's a good idea. Write me a paper on it."
actually stifles creativity, rather than fosters it.

Feedback must be continual, and often spontaneous. It must be
confidential, unless it involves praise, and always honest. It must
permit the communication of feelings, concerns, and perceptions as
well as facts. The Applications Productivity Questionnaire did not
produce any responses which complained about current feedback
practices.

Asking for Help –– An employee must be able to ask for and receive
help, information, and guidance. While this sounds like an easy thing
to do, it really means that:

     •   The manager needs to be readily accessible to
         employees, not always tied up in meetings or too

busy to talk.

- The manager needs to be able to give as much help
  or guidance as is wanted without giving more than is
  wanted.

Division Chiefs and their Deputies are busy people. Because
Applications has no formal structure below the Division level, two
persons must manage thirty or more employees. Inaccessiblity to
Division managers on short notice is a common complaint. Institution
of Branches below the Division level would help to alleviate this
problem.

Providing the Environment -- If an employee is to perform the job and
work tasks assigned, he or she must:

- Have the necessary skills, or be able to acquire
  them through training and experience.

- Be provided with an environment (equipment, facilities,
  tools, etc.) which supports the work.

In recent years the ODP training and travel budgets have been severely
reduced. The result is that truly first rate courses like IBM's
"Project Management" are restricted to a few persons per year. Thus,
Applications has come to rely heavily on in-house and on-the-job
training. The Productivity Questionnaire produced numerous complaints
that in-house training was inadequate, external training was
unavailable, and work pressures prevented on-the-job training.
Clearly there is a significant concern that Applications is not
developing technical skills needed to do the work more productively.

Our computer system development environment is excellent. The tools,
development aids, and job turn-around times are far better than found
in many data processing shops. We have little room for substantial
improvements in this area.

The workload of customer requests far exceeds ODP/Applications ability
to service them in the timeliness, quantity, and quality which it
would prefer. Thus, ODP/Applications is concerned with individual and
group productivity issues. This section addresses issues related to
the management of personnel.

2.0 Results of ODP/Applications Survey

The productivity survey form distributed by the Deputy Director for
Applications revealed some common complaints, and a few suggestions,
concerning individual productivity. These are briefly addressed
below.

"Allow more time to develop new skills"
"Assign fewer tasks per person - too many to do properly"

These comments result from a feeling that the quantity of work to be
performed prevents individuals from either learning new skills or
providing a high quality of service. Several observations are
relevant. First, individual training is readily available -- through
in-house courses and seminars; through self-study courses and texts;
and through university and corporate training. There are limits,
resulting from budget constraints, but critical training needs are
being met. Second, it is a widely held feeling that individuals are
being overloaded with work assignments which cause them to either miss
deadlines or skimp on systems development activities. Third, there is
little indication that people are routinely working overtime to
compensate for the work overload.

"Reduce staff effort being utilized on maintenance tasks"
"Need more interesting type/level of work"
"More structure in Applications with regard to maintenance and
development of work areas of speciality"

These comments reflect a concensus in two areas. First, few persons
like to maintain a system after it is developed. Second, Applications
does a great deal of very similar work. The customers may vary, but
the technical solutions are nearly identical.

"Consider an individual's preference whenever possible"
"Need more and better communications mechanisms"
"Use AWP to motivate"
"Better motivation and pride in finished product"

All of these comments center around a better supervisor/subordinate
relationship. People seem to feel that they are left out of the
overall work planning cycle. Many comments referred to the isolation
resulting from small, fragmented project structures.

"Establish performance standards for personnel based on project
stereotyping"
"Improve poor performance by senior personnel - reduce resistance to
learning new techniques and to change"
"Require employees to use a Time Event chart - make employees more
accountable for time usage"

These comments reflect the frustration felt when a person feels
overloaded with work, isolated from others, and left out of the work
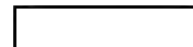
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planning cycle. It is doubtful whether the Applications personnel who made these comments would really like to punch in/out with time cards, set up daily quotas for software production, and fire everyone who does not agree with some new technique.

"Train personnel to replace those going on rotation"
"Anticipate and plan ahead for specific project training"
"Plan assignments to coincide with recent training and rotations, and plan these changes better"
"Move personnel less"

These complaints indicate that Applications management is perceived as not doing an effective job of plan-ahead personnel scheduling. More study is needed to determine whether or not this complaint is true on a wide-scale basis.

3.0 Recommendations

The following recommendations are made in hopes of improving productivity by changing the manner in which personnel are managed.

1. Begin an active study to determine the appropriate software and/or personnel metrics needed to measure Applications output. For example, lines of production program per work-month, bytes of load module per production program, etcetera.

2. Begin an active study to determine the appropriate metrics needed to measure Applications resource expenditure. For example, PRISM hours, SMF machine costs, etcetera.

3. Using the metrics devised in 1 and 2, above, begin to measureAsAmeacations productivity.

4. Use past performance to model and estimate future performance.

5. Provide a powerful personnel and task scheduling tool for use by Applications managers and project leaders. Use this tool to prevent overloading of work assignments and to determine schedule impacts for changes in priorities and assignments.

6. Establish a small technical library in [   ] This   STAT
   library should contain copies of recent technical journals, publications, and papers, training information, state-of-the-art books on topics of general interest. Encourage self study as a means of remaining competitive in the data processing field.

7. Continue to investigate the possibility of obtaining a contract for Applications documentation and maintenance tasks.

8. Stress the "life cycle" concept for computer systems development. The end product is not the software, but the total system and its user.

9. Continue to investigate ways in which software and expertise can be shared, rather than reinvented.

10. Continue to develop generalized computer solutions -- like word processing and registries.

11. Continue to stress the use of packaged software, procured and maintained by vendors, rather than in-house systems.

12. Tie training more closely to actual assignments. Use assignments as training vehicles.
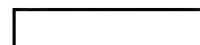
A.   Standards for Project Implementation

1.   Project Planning and Management

Present Environment: Standards receive extremely varied
treatment by different Divisions, and by size of project.

STAT   [   ]exacts minimal reporting but imposes little control
or structure. Planning and management in B, C and D
Divisions are mainly dependent on the project managers'
individual experience and sophistication combined with their
level and formality of interaction with group or Division
management. Maintenance efforts enjoy almost no formal
planning or management, leading to the perpetual obligation
of maintenance personnel to a user group or office. Present
or proposed standards do not attack these problems because:

o   They in the main do not structure project planning
and management;
o   They do not provide for the enforcement of the few
things they do cover; and
their poor applicability to conditions in Applications.

Finally, there is effectively no quality assurance authority
extant in Applications to promote the correction of these
conditions.

Work being done in this area: Work on standards in
Applications has stopped due to the unavailability of
personnel to work on them. No known effort exists to
provide QA across Applications.

Recommendations: An overall philosophy and approach for
applications development should be developed before any
specific action is taken against this problem.

2.   Project Implementation (Requirements, Development and
Maintenance Phases; Documentation)

Present Environment: Present official standards are
outmoded and often ignored, outside of A Division. Newly
drafted standards are in limbo due to unavailability of
senior personnel to complete them properly. Enforcement of
any standards depends on management and review styles of
individual project leaders and group or division management.
No consistent, independent QA authority exists.

Work being done in this area: Work on standards in
Applications is at a standstill.

Recommendations: An overall philosophy and approach for
applications development should be developed before any
specific action is taken against this problem.

B. Quality Assurance

Present Environment: No Applications-wide quality assurance
exists or is enforced. A Division pursues an effective internal
program of QA oriented to its specific project structure. B, C,
and D Divisions and Training Staff pursue QA mainly through
implementation of the personal management styles and preferences
of their Division and project managers. Previous efforts at
implementing QA have approached only parts of the problem, such
as tools (standards, SOP's, documentation support) or limited
scope support, and review services (mentors and/or boards for
specific applications types - GIM, RAMIS). These efforts have in
general failed or had limited effect because they did not work
within a single, coherent approach for K:..for Applications as a
whole, and thus broke down for lack of continuity or support in
some phase of their enforcement or use. Lack of a specific QA
directive within Applications has also forced such limited
efforts to wither and fail for lack of the ability to command
necessary resources.

Work being done in this area: Work is sanctioned in several
isolated aspects of QA, and performed mainly under the Division
or project managers. Work on Applications standards and SOP's is
at a standstill. No work on a coherent QA methodology for
Applications is known to be presently pursued.

Recommendations: A feasibility study should be commissioned on
QA for Applications to define the following:

o   Requirements;
o   Alternative implementations;
o   Recommendations.

Action should be taken on the selected alternative.

C.   Applications Management Methodology

Present Environment: Management in Applications is performed
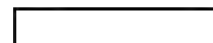using a variety of fragmented tools and procedures for its

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accomplishment. Individual managers bridge the gaps and
discontinuities between the aspects of management as well as they
can. No known overall plan exists for Applications management
methodologies, toward which efforts may be directed in the
evolution of existing procedures. Individual efforts exist to
improve reporting, task and subtask definition and monitoring,
and SOP's.

Recommendations: A detailed review of existing management tools
and procedutres should be performed to define the existing
environment and presently recognized shortcomings. Through a
comparison of the requirements of Applications (surfaced through
the review), and the practical management methods demonstrated
elsewhere, develop a model for improved management in
Applications. Schedule upgrades to Applications management, and
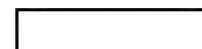implement projects to acheive those upgrades.

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Productivity   APPENDIX D
Working Group   SERVICES SUPPORT   [   ]

Better communications, between all levels of end users,
A/ODP, ED/P/ODP and SPD/P/ODP

Designate individuals with expertise in specific hardware/
software who could provide consultation to programmers (2)

Current environment:

Communications between personnel, for any reason, results from
a need to inform or be informed. Normally the path of
communication is known, however when it is not, often it is
difficult to determine who needs to be informed or whom to
request information from. At one time, ODP Consulting Services
produced a list of experts in specific hardware/software skills,
but the list was never maintained.

Recommendation:

Do a study on the feasibility of establishing an on-line
directory of specific individuals to be contacted
for consultation about matters concerning ODP functions and
available expertise in specific hardware/software.

Hire technical writer for documentation/manuals

Current environment:

Done by ODP and Users.

Recommendation:

The availability of techwriters for ODP seems highly desirable
for use in creating requirement/design specifications and RFPs,
especially when the enforcement of standardization is applied.

Designate individual or group to keep on top of utilities that
aid production and maintenance tasks.

Current environment:

A number of very good utility type functions currently exist
and are floating around, some documented and some not, none
of which have been assigned to a group or section responsible
for their maintenance. There is no central point to determine
what these utilities are or what their functions may be other
than an attachment to the Applications Standard Operating
Procedures (ASOP), a copy of which can be found in each Division.

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Recommendation:

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Do a study on the feasibility of establishing a central library, which would be maintained to include SPD's ZDISK, ☐ DLIB, along with the ASOP attachment and any other locatable production and maintenance aids.

Create an Applications Tech Staff/ Product Development Group

Create an Applications group to review requirements definition and system development (2)

Current environment:

Currently such groups exist but are not and were not designed for across the board Applications groups. Instead they perform in specialized areas; i.e., GIMS Review Board.

Recommendation:

Until across the board enforcement of (soon to be) standards is implemented, it is difficult to determine whether the need for such groups will become more evident or possibly deminish. If such groups are determined to be needed, their productiveness will be dependant on strong enforcement of standards.

Provide direct clerical SCRIPT keying support to analysts (10)

Improve secretarial force

Work being done in this area:

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☐ has been tasked with establishing the needs of Applications personnel in the area of word processing. The following is her understanding of the task.

The need for standardization regarding clerical and secretarial support becomes more apparent in ODP everyday. It is my objective to initiate this standardization by first establishing the needs of the managers, programmers and analysts in the area of word processing support and office automation. At the same time, the secretarial skills existing will be reviewed along with the secretarys' requirements and specifications for meeting the work requests of the Divisions.

Word processing in Applications is currently done in SCRIPT. By writing macros, adapting some current software (i.e., DOC) and modifying SCRIPT, word processing will become more relevant to the secretaries and this will encourage wider use of it.

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Working Group             SERVICES SUPPORT
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As a long range goal, there is the possibility of acquiring some stand-alone word processors for use in Applications on an experimental basis. Also, as standardization progresses, there will be the need for educating all concerned, from secretarial to top management. Classes will be designed and tailored to the needs arising at that time.

Recommendations:

Continue the work presently underway.

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Productivity	APPENDIX E	
Working Group	TOOLS SUPPORT	

1. Establish and publicize a library of software available in- house. This would include both software developed in- house and held currently by small groups of individuals and all commercial software packages.

    a. Present environment:

SPD maintains the ZDISK which is accessible by VM users.

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[   ] maintains a collection of routines considered to be of general interest for use in applications programming. This library, called DLIB, is currently on PANVALET. The library includes an index (IC320000) to DLIB routines. The DLIB facility was announced at a Professional Development session. At this time software routine contributions were requested. To date, no contributions have been received. Within Division B, [   ] maintains an inventory of available graphics packages and [   ] an inventory of statistics software.

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    b. Work being done in this area:

Both the ZDISK and DLIB facilities are available to users and contributions are encouraged.

    c. Recommendation:

Explore the feasibility of making DLIB a more viable tool. In order to do this an individual would be designated to maintain, publicize, and coordinate new additions to the library. The individual would have a percentage of his time allocated specifically for these functions in order to ensure the success of the software library.

Investigate the feasibility of establishing and maintaining a current inventory of software packages available to the Applications programmer.

2. Establish a library of completed applications and systems enhancements. Such an inventory would be helpful to a programmer, analyst, or project leader embarking upon a new project. It would enable him to avoid redundancies and prevent any "reinventing of the wheel."

    a. Present environment:

The CLS (Centralized Library System) maintains copies of most completed applications on PANVALET, but there is no index to

facilitate the use of CLS as a central library source for the analyst/programmer.

b. Work being done in this area:

None

c. Recommendation:

Explore the feasibility of adapting PANVALET to serve as an inventory tool for the Applications analyst/programmer. This would involve the incorporation of indicies of people, projects, and project descriptions. Ideally, the user would have on-line access to the library and a keyword search capability.

Another avenue for exploration is the adaptation of the ADTRACK System to serve as an inventory of completed applications. There is a file available in ADTRACK (PAS/SAS) which is not currently being utilized for this purpose. This file might possibly be implemented to satisfy the inventory requirement.

3. Develop generalized systems for routine applications. This mechanism should cut down considerably on the implementation time of such systems as well as facilitate their maintenance.

a. Present environment:

Applications has initiated the development of systems which can be used or easily adapted by any component for its use. D Division has developed a generalized Registry System which is being implemented for components throughout the Agency.

b. Work being done in this area:

B Division is currently developing a generalized property accountability system for use throughout the Agency by individual components. B Division is also developing Agency-wide graphics capabilities and is working with the Office of Finance to develop a financial accounting system (FAB) for use in overseas field stations. D Division is involved in the development of Agency-wide generalized word processing capabilities and a production management system to be implemented throughout the NFAC components.

c. Recommendations:

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Productivity	APPENDIX E	
Working Group	TOOLS SUPPORT	

Continue the work presently underway and investigate other possible applications which lend themselves to generalized system development.

Explore the possibility of developing a keyword index of 930 requests to facilitate the determination of applications suitable for generalized system development.

4. Develop a functional directory of resources available to the Applications analyst/programmer within ODP.

    a. Present environment:

There is currently no directory for ODP resources outside of Applications. Some junior programmers are not aware of the functions of other ODP components or of the facilities available to them through the components.

    b. Work being done in this area:

None

    c. Recommendations:

    We should publish and maintain a functional directory of resources within ODP available to the Applications analyst/programmer. Additionally, the directory should be issued to all incoming programmers. This might be a continuing part of the "Introduction to ODP" course support.

5. Make available to the analyst/programmer tools to assist in the performance of his responsibilities. Primary emphasis should be placed on the following aspects of the role of the analyst/programmer:

    o Project Planning
    o Automated Requirements Definition
    o System Definition
    o Design Methodology
    o Project Implementation
    o Documentation

<u>Project Planning</u>

    a. Present environment:

The NASAPERT/EZPERT Scheduling System is available to the analyst
to facilitate project planning. This system is composed of two
programs, NASAPERT and EZPERT. Although some analysts are aware
of this facility and find it a useful tool, many analysts are
either not cognizant of its existence or have not taken the time
to familiarize themselves with the software.

b. Work being done in this area:

The SPRINT Project in B Division is tasked to significantly
upgrade Agency-wide project planning capabilities and support,
starting with OC.

c. Recommendations:

SPRINT should be extendible to the ODP Applications project level
use.

Automated Requirements Definition and System Definition

a. Present environment:

There is no automated requirements definition tool or system
definition tool currently used by the Applications
analyst/programmer.

b. Work being done in this area:

ORD has brought a software package in-house called Problem
Statement Language/Problem Statement Analyzer (PSL/PSA). This
system, which runs interactively under the VM system, is a tool
which facilitates automated requirements definition, system
definition, and system documentation. B Division is currently
testing the facilities available through PSL/PSA.

STAT _____ currently on rotation to OER, has been
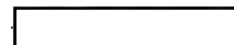investigating the SDM/70 software package.

c. Recommendations:

Continue the work being done. Consider alternate packages which
might better fit ODP requirements.

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Working Group	TOOLS SUPPORT	

Design Methodology

a. Present environment:

There is currently no design methodology tool used within Applications.

b. Work being done in this area:

PSL/PSA ace usbble duting design, but have not been applied as yet.

c. Recommendations:

We should employ PSL/PSA on an experimental basis, probably as a follow-up to its use on requirements.

We should initiate a study to investigate the design methodology software available on the commercial market.

We should explore the feasibility of employing a program design language which is structured to bridge the gap between the analyst and the customer.

Project Implementation

a. Present environment:

The programmer/analyst has available to him various implementation tools, including several programming languages, two data base management systems, and the facilities of both a batch and an interactive system. Additional facilities are available with the proliferation of minicomputer applications.

b. Work being done in this area:

Work is in progress on the GIMINI System (An adaptation of the GIMS System for the IBM 4300 series minicomputer.)

A Division has contracted a study to compare several commercially available data base management systems. Project SAFE is currently investigating various text search data base management systems.

c. Recommendations:

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Productivity   APPENDIX E
Working Group   TOOLS SUPPORT

(1) Increase the awareness and use of generalized routines written in-house, as well as commercially written generalized systems, to perform routine tasks.

(2) Perform a study of the available data base management systems. A comparison should be made between our current DBMS's and those available outside of the Agency.

Documentation

a. Present environment:

There are no Applications-wide documentation tools. C Division developed an on-line documentation tool called the Human Resources (HRS) Data Element and Documentation System. HRS is composed of two programs, DATADOC for defining data elements and PROGRAMDOC for identifying data elements in specific programs. This system was developed by the PERSIGN II Development Team and made available to the Division for its use. Additional documentation tools available in-house include SCRIPT, AIM, and SYSPUB.

b. Work being done in this area:

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[   ] is gathering information about data dictionaries available on the commercial market. He plans to write a summary of his findings with a recommendation to purchase the data dictionary most appropriate for Logistics Integrated Management System use.

c. Recommendations:

Perform a study of the documentation tools available on the commercial market.

NOTE: A major consideration in the choice of a documentation tool is that it must interface with the tools used during the project development and implementation phases. In lieu of this, the study of tools available to the analyst/programmer might best be accomplished by considering tools to facilitate the totality of the project development and implementation cycles.

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Productivity	APPENDIX F	
Working Group	TRAINING	

1. Develop in-house course on project planning, use people from all divisions as instructors.

   Present environment:

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   Presently there is a System Analysis Workshop course offered by ☐ for a five-day duration. The course is workshop oriented with live problems presented for separate team solution. Included in the course is a portion on project planning.

   We presently use part-time instructors from other divisions in Applications and Processing to supplement course requirements. These have proven to be very satisfactory solutions for some of our problems.

   There are self-study courses on video tape of the Training Staff's System Analysis course and two self-study courses available relating to project planning. They are "System Analysis Training" produced by Advanced Systems, and "Managing the Application Development Process" produced by IBM.

   Suggestions:

   Use of personnel from all divisions could be one solution if the time and desire to participate is indicated. It would require development of materials, scheduling of classrooms, enrollment of students and prep time for the instructors.

2. Test personnel for qualifications before enrolling them in classes.

   Present environment:

   Presently required prerequisites or comparable experience are stated on the enrollment notices that are sent to individuals. There are prerequisite requirements for all courses with the exception of IEDP, BVM, and reading JCL.

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Productivity	APPENDIX F	
Working Group	TRAINING	

In lieu of testing, it has been left to the discretion of the supervisor to enroll personnel that they feel are qualified and are in need of the proposed training.

Suggestions:

Supervisors should scrutinize their personnel to make sure that they are in fact being enrolled in courses that will be utilized for their current and proposed tasks and do have appropriate background.

3. Increase curriculum, both internal and external.

Present Environment:

The Training Staff offers a variety of 30 courses that are taught internally. Most of these same courses are also available at the self-study lab on video tape for students' convenience.

In addition to the above courses, the Training Staff sponsors Systems Analysis Workshop, Project Management, and Project Implementation from outside vendors. These courses are scheduled based on needs and funds available. Normally these courses are scheduled one to two times a year.

Special courses are also offered from outside sources as the needs arise; i.e., Computer Graphic Display, Delta Data Operation, Basic Programming Language for use on the Delta Data Minicomputer and Technical Writing. The Basic Programming Language course will become part of the Training Staff's normal schedule in the near future after Delta Data fulfills their instruction obligation.

Another available source is local universities for those people interested in evening programs. Most available is UVA where courses are offered at Hqs and taught by Agency instructors.

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Productivity	APPENDIX F	
Working Group	TRAINING	

Operations Division presently has 20 Computer Aided Instructions courses that run on the VM/370 System. The courses are utilized to train personnel in the operations field. Included in the 20 courses are three that the Training Staff is in the process of evaluating to determine if they would be useful for Applications personnel. The three are BVM, JCL, and Basic PL/I. A pilot program relating to the above mentioned courses will be forthcoming.

Suggestions:

Courses that are desired should be brought to the attention of individual Division Chiefs, Deputy Division Chiefs or Project Leaders. These requests could then be forwarded through present channels for appropriate evaluation and action.

4. Need in-house training more related to Applications' needs.

Present Environment:

Courses that are presently being offered are geared to current software and hardware needs of the divisions. The courses cover both current and future system requirements.

The courses are aimed at computer and user personnel that are deemed necessary for successful completion, maintenance, and execution of systems.

Suggestions:

Same as referenced in item 3 above.

5. Need training courses to be offered part-time vice full- time.

Present Environment:

Approved For Release 2003/08/26 : CIA-RDP84-00933R000100050001-7

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Productivity   APPENDIX F
Working Group   TRAINING

At present all courses are scheduled on a full-time basis. This procedure allows ample time for scheduling of instructors, students, preparation of materials, and most importantly, obtaining adequate classroom facilities.

One course, Introduction to EDP has been scheduled in some instances for half-day sessions spread over a five-day period. When this is done two classes run, one in the morning and one in the afternoon. This method has worked fairly. well for Introduction to EDP and could be utilized for other courses in special circumstances. However, given the limited numbers of instructors, classrooms, and the varying lengths of courses, it would be impractical to schedule the full range of Training Staff courses on a part-time basis. Also, most of the Training Staff courses are designed to teach specific skills in a relative short period of time.

Suggestions:

If more classrooms and instructors were available, this concept might be utilized more in future courses.

6. Need training courses on high interest current topics, advanced subjects, and the newest techniques for (software and hardware development).

Present Environment:

The Training Staff presently offers a bi-weekly Career Develop- ment Program that includes movies on some of the latest EDP techniques and tools available within the industry. The movies are supplemented by a 30-minute presentation from personnel from Applications and Processing Divisions relating to topics that should be of interest to ODP personnel.

Prior to setting the agenda for each Applications Professional Career Development Program series, topics, speakers, and personnel desires are solicited to try and obtain ideas for presentation of material that would be of interest and helpful to ODP personnel.

Suggestions:

Prior to scheduling the next series of the bi-weekly programs, an increased effort to solicit and evaluate ideas for content should be implemented.

7.   Provide requirements definition training.

Present Environment: STAT

Presently this topic is included in the [   ] System Analysis Workshop course that is offered twice a year.

This topic is also included in the video tape courses offered by the Training Staff for the self study program.

Outside training for this type of course is also available at local universities.

8.   Use Training Staff to teach advanced topics instead of basic user courses.

We have in the past developed courses in Advanced PL/I and Ramis topics at the request of Applications. However, when the courses were presented, there was very poor attendance from Applications personnel.

Present Environment:

The Training Staff presently offers courses on intermediate levels of PL/I, VM and writing JCL A five-part course on GIM II and a four-part course on RAMIS are also offered. Each part is based on completion of the proceeding course.

To enroll in the above courses, basic courses or equivalent experience is required.

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Another reason for basic courses is that current systems are being designed for users to enter and process data required to run their systems. These requirements are part of the system documentation that state certain type training must be made available for users to participate in implementation and execution of the the system.

Suggestions:

- Implement procedures wherein user offices instruct some of the basic courses for their own office needs. Example being the Office of Communications and OT&E have in the past taught Basic VM and SCRIPT courses aimed at their individual needs.

9. Provide continued training for analysts/programmers in structured techniques.

Present Environment:

Structured techinques for programming in Basic and Intermediate PL/I are presently being taught.

Applications has produced a document on guidelines and standards that relates to software development that is geared to this idea. The document was created by selected individuals from all divisions of Applications. The paper is currently being evaluated by managers from Applications prior to release.

10. Have publications and briefings on generalized software development in all divisions.

Present Environment:

Publications are available in the Training Staff on software, hardware, tools, and techniques that are utilized and being proposed within the EDP world.

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Productivity   APPENDIX F
Working Group   TRAINING

Briefings can relate back to question 6 which gives information about the Applications Career Development Program.

Suggestions:

Individual divisions should become more aware of what publications would be useful to their needs and applications.

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Applications   UNCLASSIFIED   1 May 1981
Productivity   APPENDIX G
Working Group   ENVIRONMENT

1. Provide sufficient terminal support.

    a. Present environment:

        By far the most discussed environmental problems are the
lack of terminals and the amount of downtime associated with
communications facilities and computers. Personnel are very
easily frustrated when terminal support is unavailable. In
some cases, the individual must leave his/her normal working
area to find an available terminal. This deprives them of
any incoming phone calls or office visitors while away.
However, the biggest frustration comes about when because of
either communication or computer hardware problems, there are
no or a significantly reduced number of terminals. Be it
right or wrong, considerable time is spent while "cruising"
for a terminal that works or "kabitzing" with fellow workers
about the present situation.

    b. Work being Done in this area:

        None.

    c. Recommendation:

        When lines are available, more terminals are required.

2. Travel

    a. Present environment:

        Our distance from Hdqs. appears to be the second most
popular item of discontent. The majority of this deals with
having to travel to meet with customers. A significant
portion of time is spent traveling between buildings as well
as waiting for the next shuttle. Most of us appear to be
reluctant to ask the customer to travel. We are also
deprived of personal contact with ODP components in Hdqs.;
e.g., CSS, SPD, CLS, ODP Admin., and the front office.

    b. Work being done in this area:

        None.

    c. Recommendation:

        Official management guidance should be forthcoming to
encourage Applications personnel to request the customer to
travel.

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Productivity   APPENDIX G
Working Group   ENVIRONMENT

3.   Office facility.

     a.   Present environment:

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          Not much was reported about the actual physical environment of ☐ There were scattered complaints about noise, typewriters, and the Design 100's.

     b.   Work being done in this area:

STAT   ☐ have been ordered for the Design 100's.

     c.   Recommendations:

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4.   Better print support.

     a.   Present environment:

          For Applications personnel creating documents requiring quality printing, there is approximately a 24-hour wait.

     b.   Work being done in this area:

          At this time, no TEMPEST-approved, high-quality, high-speed printers are available for ☐   STAT

     c.   Recommendations:

          When available, acquire ☐ high-speed, high-quality STAT printer.

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Applications   UNCLASSIFIED   1 May 1981
Productivity   APPENDIX H
Working Group   END USER DEVELOPMENT

1. Make software available which will allow the end user to do applications development and relieve ODP of applications maintenance responsibilities.

    a. Present environment:

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        End user applications development is being done in some offices (OER, OPA, OF, OCR, NPIC, OD&E, OSWR, OCO, OSR, [   ] OGSR) where small staffs of user personnel have been trained in the use of VM, BASIC, RAMIS, CP/CAM, and sometimes PLI. These groups are capable of creating and maintaining simple multi-file systems independent of ODP professionals. Many other people in the user community have learned the RAMIS report language and are able to create reports from RAMIS and GIMS data bases. What is lacking is the capability to do simple applications development without conventional programming (PLI, BASIC) or hierarchical file design (RAMIS) and with a maximum of two or three days of training.

    b. Work being done in this area:

        (1) Several offices (OER, OLC, OL) are interested in obtaining an applications generation software package called INFO which runs under VM/CMS and which will have terminal interfaces for both the 5260 and 7260 Delta Data terminals.

        (2) ORD is working closely with Relational Software, Inc. in the development of ORACLE (See Section 3, below), a relational data base management system which will have a version that runs under VM by late 1981 and which is supposed to eventually have many user friendly features, such as interactive forms creation, interactive report creation, and flat file structures.

        (3) Applications is gradually implementing a policy which requires that offices that have ODP personnel on rotation assume PAS responsibility for their applications.

    c. Recommendations (930):

        (1) Define an office policy on the support of user developed applications and the use of applications development software.

        (2) We should study user reaction to and use of INFO and ORACLE and determine if these products can be used to offload some of the smaller application development tasks to the user.
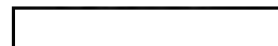
(3) Evaluate other products such as National CSS's NOMAD.

(4) Plan for the replacement of older, high maintenance
systems. If this can be done through the use of
applications generation software and/or data base systems,
maintenance will be reduced.

(5) Train users to use applications generation software
like INFO so that they can replace obsolete systems. User
created systems should be maintained by the user.

2. Obtain software which will facilitate the creation of prototype
systems for user review prior to expending the resources for major
system development tasks.

    a. Present environment:

        We have no capability of this kind.

    b. Work being done in this area:

        None.

    c. Recommendation:

        (1) Send Applications people to Guide/Share and task them
        to look for solutions to specific issues (targets).

        (2) Explore the applicability of the software identified in
        Section 1 above to this requirement.

3. Obtain additional graphics capabilities, such as TELAGRAF:

    a. Present environment:

        DISSPLA and TELAGRAF are available to VM users. OGSR owns a
        Genagraphics interactive graphics device.

    b. Work being done in this area:

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        (1) [   ] of B Division has been tasked to define
        requirements for a family of graphics terminals, some of
        which will support interactive graphics development
        software.

        (2) OL has a near term requirement to develop an in-house
        graphics creation capability to replace a contractor
        graphics development service which terminates the end of FY

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Applications	UNCLASSIFIED	1 May 1981
Productivity	APPENDIX H	
Working Group	END USER DEVELOPMENT	

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81. OL is coordinating their effort with [   ] and ODP Engineering Division.

c. Recommendation:

Continue the work presently underway.

APPENDIX I

17 March 1981

MEMORANDUM FOR: Deputy Director for Applications

STAT   FROM   :   [   ]
                              CAMS Project Manager

SUBJECT   :   CAMS2 Development Facility

REFERENCES   :   1.   "Accommodating Staff with a Friendly Facility",
                           Computer Decisions, March, 1981.

                     2.   Software Package Human Factors in Computers
                           and Information Systems, [   ]   STAT

                     3.   "Technology Update Egronomics: The Human
                           Factor", Output, March, 1981.

     1.   The quality and quantity of programmer workspace has a
profound impact on programmer productivity.   Inadequate
workspace causes needless stress, strain, and fatigue
resulting in costly turnover, tension, and inaccuracy,
bug-filled software, and missed target dates.   A study
at IBM Santa Teresa Laboratory showed a 50% decrease in
programming errors after they moved their programmers into
a facility designed to meet programmer needs.   Last year,
STAT   in the new facility, [   ] programmers produced a
record-breaking amount of this more error free code.   At
STAT   [   ], a 40% increase in productivity was
obtained from a 50% increase in workspace.   While 30 sq. ft.
of workspace per data entry person is adequate, 95-100
sq. ft. is needed per programmer.   These figures exclude common
areas.   Such experiences as mentioned above have convinced
STAT   [   ] Information Systems to construct a new facility
to house 700 programmers.   Although [   ] is keeping specific   STAT
predictions in house, they have stated publicly that they
expect "a significant rise in programmer productivity".

2.   Approximately 165 person years of effort on the CAMS2(P/S) Development project is programmer time. The total cost for this over the life of the project is projected to be well over $16 million. A 50% change in efficiency could significantly affect project costs and/or our ability to meet specific IOC dates.

3.   Regardless of the location of the CAMS2 Development facility (i.e., GFE or contractor provided), the information summarized in the above paragraphs (and explained in detail in the references) demonstrates that special attention should be given to the ergonomic features for the new facility. · Consideration should include:

   a.   Workspace -- 95-100 sq. ft. per person, including sufficient conference room areas.

   b.   Accessibility -- Location, parking, convenient to public transportation.

   c.   Lighting -- Reducing eyestrain will reduce fatigue, stress.

   d.   Privacy -- Keeping interruptions to a minimum will allow for completeness of thought.

   e.   Work Area Layout -- Including secure storage, desks, files, etc.

   f.   Communications -- Secure phone service to every desk is mandatory - reliable communications for remote terminals, printers, etc.

4.   Considering the physical space history of the CAMS Project, 7 cramped locations in 6 years, and our emphasis on productivity, I believe the time is ripe to create a good working facility for the CAMS Project Office. Therefore, I intend to pursue this course of action unless otherwise directed.

STAT

Distribution:
   0 - Adse
   1 - DD/ODP
   1 - [   ] Chairman, Applications Productivity Working Group
   1 - C/AD/ODP

STAT

APPENDIX J

COMPUTER APPLICATIONS REQUEST/ACTION FORMS

SEE INSTRUCTIONS
ON BACK OF SET
COMPUTER APPLICATIONS REQUEST/ACTION FORM

TO: Director of Data Processing   ODP   2D-0105
☒ ATTN: *Deputy Director For Applications*   ☐ ATTN: *Chief, Production Division*

1. REQUESTING OFFICE	2. REQUESTER'S CONTROL NO
DD/A/ODP	STAT J-1

3. REQUESTER'S NAME	4. EXTENSION	5. DATE
		1 May 1981

STAT

R E Q U E S T

6. SERVICES REQUESTED *(use additional sheets if necessary)*

Develop an overall methodology and standard approach for
applications development (incorporating requirements, design,
implementation, and documentation) and management. Implement the
methodology by developing, as required, automated support for
requirements and design analysis/specification, by developing
and upgrading implementation and documentation tools, and by
providing necessary management tools. Portions may be accomplished
under contract.

7. TYPE OF REQUEST	PRODUCTION		PROGRAM FIX		ONE TIME	
	MODIFICATION	X	NEW REQ'MT		OTHER *(specify)*	

8. PROJECT NAME	9. COST NOT TO EXCEED

10. COST·OTHER THAN ADP	11. TARGET DATE	12. APPROVED BY
$		

DO NOT WRITE BELOW THIS LINE - TO BE COMPLETED BY ODP

A C T I O N

CUST. CODE	PRISM NO. · SUB. NO.	ACTIVITY	DATE RECEIVED	DATE COMPLETED	PRODUCTION DATE

	FEASIBILITY		DESIGN		PRE·PRODUCTION	DESCRIPTION
	PROPOSAL		DETAIL DESIGN	OTHER		

EST. MANHOURS	EST. MACH. COST	TOTAL COST	TARGET DATE
1.			
2.			

TEAM MEMBERS (*l leader*)	START DATE	EST. END DATE		TEAM MEMBERS	START DATE	EST. END DATE
1.			6.			
2.			7.			
3.			8.			
4.			9.			
5.			10.			

REMARKS

DATE	APPROVED BY

FORM   930   OBSOLETE PREVIOUS
10-76   EDITIONS

SEE INSTRUCTIONS ON BACK OF SET

COMPUTER APPLICATIONS REQUEST/ACTION FORM

TO: Director of Data Processing   ODP   2D-0105
☒ ATTN: Deputy Director For Applications   ☐ ATTN: Chief, Production Division

1. REQUESTING OFFICE DD/A/ODP	2. REQUESTER'S CONTROL NO. J-2

3. REQUESTER'S NAME	4. EXTENSION	5. DATE 1 May 1981

STAT (left margin)   **STAT** (right margin)

R E Q U E S T

6. SERVICES REQUESTED (use additional sheets if necessary)

Develop standardized metrics for resource utilization and productivity. Integrate the collection and processing of these metrics with Applications' management and development methodologies

7. TYPE OF REQUEST	PRODUCTION	PROGRAM FIX	ONE TIME
	MODIFICATION	X NEW REQ'MT	OTHER (specify)

8. PROJECT NAME	9. COST NOT TO EXCEED

10. COST-OTHER THAN ADP $	11. TARGET DATE	12. APPROVED BY

DO NOT WRITE BELOW THIS LINE - TO BE COMPLETED BY ODP

A C T I O N

CUST. CODE	PRISM NO. - SUB. NO.	ACTIVITY	DATE RECEIVED	DATE COMPLETED	PRODUCTION DATE
	FEASIBILITY	DESIGN	PRE-PRODUCTION	DESCRIPTION	
	PROPOSAL	DETAIL DESIGN	OTHER		

EST. MANHOURS	EST. MACH. COST	TOTAL COST	TARGET DATE
1.			
2.			

TEAM MEMBERS (#1 leader)	START DATE	EST. END DATE	TEAM MEMBERS	START DATE	EST. END DATE
1.			6.		
2.			7.		
3.			8.		
4.			9.		
5.			10.		

REMARKS

DATE	APPROVED BY

FORM 930 OBSOLETE PREVIOUS EDITIONS
10-76

CLASSIFICATION

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(13-21-89)

CLASSIFICATION

SEE INSTRUCTIONS ON BACK OF SET

STAT   STAT

TO:	Director of Data Processing ODP 2D-0L05
	☒ ATTN: Deputy Director For Applications ☐ ATTN: Chief, Production Division

1. REQUESTING OFFICE	2. REQUESTER'S CONTROL NO.
DD/A/ODP	J-3

3. REQUESTER'S NAME	4. EXTENSION	5. DATE
		1 May 1981

6. SERVICES REQUESTED *(use additional sheets if necessary)*

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Develop a software engineering tools library. Provide tools
and techniques to implement incentives for contributions,
training and maintenance. Collect tools and initiate the library.

7. TYPE OF REQUEST	PRODUCTION		PROGRAM FIX		ONE TIME	
	MODIFICATION	X	NEW REQ'MT		OTHER (specify)	

8. PROJECT NAME	9. COST NOT TO EXCEED

10. COST-OTHER THAN ADP	11. TARGET DATE	12. APPROVED BY
$		

DO NOT WRITE BELOW THIS LINE - TO BE COMPLETED BY ODP

CUST. CODE	PRISM NO. - SUB. NO.	ACTIVITY	DATE RECEIVED	DATE COMPLETED	PRODUCTION DATE
	FEASIBILITY	DESIGN	PRE-PRODUCTION	DESCRIPTION	
	PROPOSAL	DETAIL DESIGN	OTHER		

EST. MANHOURS	EST. MACH. COST	TOTAL COST	TARGET DATE
1.			
2.			

	TEAM MEMBERS (#1 leader)	START DATE	EST. END DATE	TEAM MEMBERS	START DATE	EST. END DATE
A	1.			6.		
C	2.			7.		
T	3.			8.		
I	4.			9.		
O	5.			10.		
N	REMARKS					

DATE	APPROVED BY

FORM 930 OBSOLETE PREVIOUS EDITIONS
10-76

CLASSIFICATION

I - ODP

(13-21-23)

COMPUTER APPLICATIONS REQUEST/ACTION FORM

TO:	Director of Data Processing ODP 2D-0105	
	☒ ATTN: *Deputy Director For Applications*	☐ ATTN: *Chief, Production Division*

1. REQUESTING OFFICE	2. REQUESTER'S CONTROL NO.
DD/A/ODP	J-4

3. REQUESTER'S NAME	4. EXTENSION	5. DATE
		1 May 1981

6. SERVICES REQUESTED *(use additional sheets if necessary)*

Develop an inventory and index of software applications,
referencing people, projects and keywords.

R E Q U E S T

7. TYPE OF REQUEST	PRODUCTION		PROGRAM FIX		ONE TIME	
	MODIFICATION	X	NEW REQ'MT		OTHER *(specify)*	

8. PROJECT NAME	9. COST NOT TO EXCEED

10. COST-OTHER THAN ADP	11. TARGET DATE	12. APPROVED BY
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DO NOT WRITE BELOW THIS LINE - TO BE COMPLETED BY ODP

CUST. CODE	PRISM NO. - SUB. NO.	ACTIVITY	DATE RECEIVED	DATE COMPLETED	PRODUCTION DATE

	FEASIBILITY		DESIGN		PRE-PRODUCTION	DESCRIPTION
	PROPOSAL		DETAIL DESIGN	OTHER		

EST. MANHOURS	EST. MACH. COST	TOTAL COST	TARGET DATE
1.			
2.			

A C T I O N

TEAM MEMBERS (#1 leader)	START DATE	EST. END DATE	TEAM MEMBERS	START DATE	EST. END DATE
1.			6.		
2.			7.		
3.			8.		
4.			9.		
5.			10.		

REMARKS

DATE	APPROVED BY

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